

The Origin of Cambrian Mid-Platform Hydrothermal Dolomites

Victoria A. Jeary*
Department of Geology and Geophysics
The University of Calgary, Alberta
jeary@geo.ucalgary.ca

and

Dr. Ronald J. Spencer
Department of Geology and Geophysics
The University of Calgary, Alberta
spencer@geo.ucalgary.ca

Several hydrothermal dolomite bodies occur along the Cathedral platform margin, otherwise known as the Kicking Horse Rim. Yao and Demicco (1994) examined these dolomites and concluded that the hydrothermal dolomite extends from the margin eastward for about only 10 km; they also concluded that the most pervasive dolomitization is within 2 to 3 km of the platform margin. However, a replacement dolomite 55 km east of the middle Cambrian platform margin, a distance significantly greater than 10 km, exists along the David Thompson Highway at Whirlpool Point.

The Whirlpool Point replacement dolomite is located along a large-scale northeast-southwest trending regional Cambrian structure, coincident with the Snowbird Tectonic Zone. This suggests the origin of this, and other, mid-platform replacement dolomites may be related to this structure.

The origin of replacement dolomites in general is controversial and additional complications to pre-existing theories arise with the presence of hydrothermal dolomites on the mid-platform, away from the margin. In order to resolve these problems the following questions should be addressed: 1) What was the chemistry of the ancient aqueous dolomitizing fluid? 2) Under what temperature and depth conditions did that fluid alter the host rock? 3) What hydrologic system existed to obtain observed fluid chemistry and supply the necessary Mg^{2+} to precipitate dolomite? 4) What event(s) could have triggered brecciation and initiated changes in fluid chemistry of the system? 5) Is the location, shape and extent of dolomitization controlled by structure, stratigraphy, or both?